AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Cancel claims 1-32.

33. (New) A non-invasive device for measuring blood temperature in a circuit for the extracorporeal circulation of blood, said device comprising a line for receiving blood from a patient, and a temperature sensor connected to said line and generating a first signal indicative of a blood temperature of the blood flowing in said line, said temperature sensor comprising a device for measuring an intensity of an electromagnetic radiation, and said line comprising a connecting portion facing said measuring device and permeable to electromagnetic radiation in a first wave band; said first signal corresponding to an intensity of said electromagnetic radiation in said first wave band.

34. (New) A device according to claim 33, wherein said measuring device is housed within a casing, behind a window formed in said casing; said connecting portion of said line being completely superimposed on said window, to cover a solid angle of view of said measuring device.

35. (New) A device according to claim 33, wherein said measuring device comprises a thermopile, having at least one hot junction and at least one cold junction.

36. (New) A device according to claim 35, wherein said temperature sensor comprises a temperature controller, said temperature controller maintains the at least one cold junction at a controlled temperature.

37. (New) A device according to claim 36, wherein said temperature controller comprises:

a thermistor, connected thermally to the cold junction of said measuring device, said thermistor supplying a second signal, said signal corresponding to said controlled temperature;

a solid state heat pump, having a low temperature surface thermally connected to said measuring device and a high temperature surface; and

a control circuit, connected to said thermistor, to receive said second signal, said control circuit also being connected to said heat pump to supply a control signal correlated with said second signal.

38. (New) A device according to claim 37, wherein said heat pump comprises a Peltier cell.

39. (New) A device according to claim 37, comprising a heat sink element placed in contact with said high temperature surface of said heat pump.

40. (New) A device according to claim 37, wherein said controlled temperature is a constant temperature in the range from 5°C to 15°C.

41. (New) A device according to claim 33, wherein said connecting portion is made from a material having a substantially constant transmittance in said first wave band, and said material having an absorbance substantially equal to zero in said first wave band.

42. (New) A device according to claim 33, wherein said connecting portion is made from a material having an essentially constant transmittance in a temperature range from 30°C to 40°C.

43. (New) A device according to claim 33, wherein said connecting portion is made from a material chosen from a group including high-density polyethylene, low-density polyethylene, and poly(4-methyl-1-pentene).

44. (New) A device according to claim 33, further comprising a filter interposed between said measuring device and said connecting portion of said line.

45. (New) A device according to claim 44, wherein said filter comprises a sheet of material being substantially opaque to electromagnetic radiation outside a second wave band and lying within said first wave band.

46. (New) A device according to claim 45, wherein said second wave band is in a range from 8 μm to 14 μm.

47. (New) A device according to claim 45, wherein said filter includes germanium.

48. (New) A device according to claim 45, wherein said filter has one face facing said connecting portion of said line.

49. (New) A device according to claim 33, wherein an infrared radiation band includes at least a portion of said first wave band.

50. (New) A device according to claim 36, comprising a control unit associated with said temperature sensor, for receiving said first signal and for determining said blood temperature according to:

$$T_P = F(V_B) + T_0,$$

where T_P is the blood temperature, V_B is the first signal, and T_0 is the controlled temperature.

51. (New) A device according to claim 50, wherein:

$$F(V_B) = K*V_B$$

where K is an experimentally determined constant.

52. (New) A control apparatus for an extracorporeal blood circuit, said extracorporeal blood circuit being connected to a blood purification machine, said extracorporeal blood circuit further comprising an arterial branch connected to at least one blood treatment element and a venous branch connected to at least one blood treatment element, the control apparatus comprising a non-invasive device for measuring a blood temperature according to claim 33.

53. (New) An apparatus according to claim 52, wherein the non-invasive device has a sensor for measuring a first blood temperature of blood leaving a patient along the arterial branch upstream of said blood treatment element, a control unit configured to regulate a blood temperature in the extracorporeal blood circuit as a function of the first blood temperature and a reference temperature, and a device for regulating the blood temperature in the extracorporeal blood circuit, said device being connected to a portion of the venous branch downstream from said blood treatment element.

54. (New) An apparatus according to claim 53, wherein said regulating device, is combined with said portion of the venous branch to form a heat exchanger; said control unit being connected to said temperature regulating device.

55. (New) An apparatus according to claim 53, wherein said regulating device comprises a line for conveying a fluid which can be heated to a fluid temperature lying within a specified range, about 37° C.

56. (New) An apparatus according to claim 53, wherein said regulating device has a seat configured to house said portion of the venous branch.

57. (New) An apparatus according to claim 53, wherein said extracorporeal blood circuit is connected to a pump to convey the blood along the extracorporeal blood circuit, the apparatus comprising a sensor for detecting an operating state of the pump; the control unit keeping the fluid temperature substantially equal to said predetermined temperature when the pump is not in operation.

58. (New) An apparatus according to claim 53, wherein said venous branch has a post-dilution node; said portion of the venous branch being located downstream of said post-dilution node.

59. (New) An apparatus according to claim 53, wherein said blood treatment element comprises a hemodialysis filter, said hemodialysis filter comprising a blood compartment and a dialysate compartment within which a dialysate flows.

60. (New) An apparatus according to claim 53, wherein said blood treatment element comprises a hemodialysis filter comprising a blood compartment and a dialysate compartment within which a dialysate flows, and a pre- or post-dilution node for the introduction of a replacement fluid.

61. (New) An apparatus according to claim 53, wherein said blood treatment element comprises a hemofiltration filter.

62. (New) An apparatus according to claim 53, wherein said blood treatment element comprises a hemofiltration filter and a pre- or post-dilution node for the introduction of a replacement fluid.

63. (New) An apparatus according to claim 53, wherein said control unit regulates the blood temperature in the extracorporeal blood circuit as a function of the first blood temperature and the reference temperature at predetermined time intervals.

64. (New) An apparatus according to Claim 53 or 63, wherein said control unit regulates the overall temperature as a function of the difference between the first blood temperature and the reference temperature.